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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,468	07/22/2004	Michihiko Shouji	24530-004	4022

32137 7590 08/24/2005

Attention: PATENTS
COWAN, LIEBOWITZ & LATMAN, P.C.
1133 AVENUE OF THE AMERICAS
NEW YORK, NY 10036

EXAMINER	
LAY, MICHELLE K	
ART UNIT	**PAPER NUMBER**
2672	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/502,468	SHOUJI, MICHIHIKO	
	Examiner	Art Unit	
	Michelle K. Lay	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 July 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because the boxes of Figs. 1, 14, and 16 illustrating the system do not have descriptive labels. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim **1 – 8**, **11 – 15**, **18 – 22**, **25** are rejected under 35 U.S.C. 102(b) as being anticipated by "Evaluation of Artificial Reality: Chapter 1".

2. In regards to claims **1 – 4**, **11**, **12**, **18**, **19**, **25** –

The system is for superimposing an outer appearance formed by CG on an assistive robot performing tasks indoor. The error of the CG display position is such that the size of the displayed CG is increased larger than the actual robot [pg. 18, lines 7 – 15]. This increased size of the display CG corresponds to the nimbus as disclosed (claims **1 – 4**, **11**, **12**, **18**, **19**, **25**: ***a nimbus generating device for generating a nimbus image around a periphery of the computer graphics***). The configuration of an augmented reality image display system is shown in Fig. 1.32. Based on the visual point position and attitude information obtained from a three-dimensional position sensor attached to the head, CG are generated by a computer (claims **3**, **4**, **12**, **19**, **25**: ***an image generating device for generating computer graphics in a figure corresponding to a figure of an actual object and a positional relationship between an observer, who is viewing the actual object, and the actual object***) [pg. 10, lines 24 – 25; pg. 11, line 1]. Furthermore, the CG can be selected by taking the

form of a character that the user likes, a deceased spouse, or the like (claims **1**, **2**, **11**, **18**: ***an image selecting device for selecting computer graphics in a figure of an actual object and a positional relationship between an observer, who is viewing the actual object, and the actual object***) [pg. 7, lines 1 – 3; Fig. 1.3]. Simultaneously, a real image of the background is obtained from a CCD camera, and using the luminance key synthesis of a video mixer (claims **1 – 4**, **11**, **12**, **18**, **19**: ***a combined image generating device for generating a combined image combining the graphics and the nimbus image***), each are synthesized and displayed on an HMD as augmented reality (claims **1 – 4**, **25**: ***an image display processing device for displaying the combined image on an display which is viewed by the observer so that the combined image is superimposed on the actual object***) [pg. 10, lines 24 – 25; pg. 11, lines 1 – 4]. The video mixer also doubles as the combined image sending device as disclosed in claims **2** and **4**, where as shown in Fig. 1.32, the video mixer sends the combined image of the CG and real image obtained by the camera to the HMD (claims **2**, **4**: ***a combined image sending device for sending the combined image to the observer side***). Furthermore, in this system, an Isotrak2 (made by Polhemus) is used as the magnetic three-dimensional position sensor. The computer is a TD-30 (made by Intergraph; CPU: Pentium 133 MHzx2, with built-in Open GL graphics accelerator), and an FS5 (made by Virtual Research Systems) is used as the HMD [pg. 11, lines 5 – 10]. These provide the means as disclosed in claims **18** and **19**.

3. In regards to claims **5**, **13**, **20** –

The system is for superimposing an outer appearance formed by CG on an assistive robot performing tasks indoor. Since the total width of the robot performing a carrying task or the like is about 500 mm, and moreover, the robot is used indoors, it is assumed that it operates nearly 2 m in front of the user. The error of the CG display position is such that the size of the displayed CG is increased larger than the actual robot by as much as this error [pg. 18, lines 7 – 15]. This increased size of the display CG corresponds to the nimbus as disclosed. The maximum position error corresponds to the positional error when the robot is some distance away. The CG can be increased to counterbalance this error (claims **5**, **13**, **20**: ***wherein said nimbus generating device estimates an error in measurement of a distance between the observer and the actual object, and generates based on the error the nimbus image having an adequate thickness for preventing the actual object from being seen protruding from a periphery of the computer graphics***) [pg. 18, lines 19 – 22].

4. In regards to claims **6**, **14**, **21** –

From the example cited in claim rejections 5/1, 5/3, the maximum error (22 mm) corresponds to the positional error (44 mm) when the robot is 2 m away from the user. The resulting error is about one-tenth the size of the robot, and the CG can be increased to counterbalance this error. By correcting the three-dimensional position sensor, it is thought that the error can be controlled within a substantially permissible range (claims **6**, **14**, **21**: ***wherein said nimbus generating device generates the***

nimbus image having an adequate thickness for not showing the observer a displacement which occurs between the actual and the computer graphics when the actual object or the observer moves) [pg. 18, lines 16 – 20; pg. 19, line 1].

5. In regards to claims **7**, **15**, **22** –

In order to superimpose the CG on the robot and synthesize an image without a feeling of incompatibility, accuracy was required of the three-dimensional position sensor [pg. 12, lines 1 – 3]. As seen in Fig. 1.34, the rotation of the head to the right and left is measure by the sensor as a change in angle of direction, the tilting back and forth is measured as a change in the angle or elevation, and the tilting to right and left is measured as a change in the angle of torsion (claims **7**, **15**, **22**: ***a detecting device for detecting at least one of distance and an angle between a display with is viewed by the observer and the actual object and a direction of the actual object seen from the observer***) [pg. 13, lines 4 – 8].

6. In regards to claim **8** –

The CG of a human shape on an arm-type care-giving robot used for a carrying task actually located at a position 2m away from the user [pg. 20, lines 7 – 9]. Furthermore, although a CG was superimposed on a target robot standing still, the robot actually changes position and attitude over time (claim **8**: ***wherein the actual object is a humanoid robot or an animal-type robot other than a human, which can move freely***) [pg. 22, lines 7- 9].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims **9**, **16**, **23** rejected under 35 U.S.C. 103(a) as being unpatentable over "Evaluation of Artificial Reality: Chapter 1" in view of Yuasa et al. (US Patent No. 6,184,888 B1).

"Evaluation of Artificial Reality: Chapter 1" teaches the limitations of claims **9**, **16**, and **23** with the exception of disclosing receiving the computer graphics from outside via a network. However, Yuasa et al. teaches an image rendering apparatus and method intended for use in an environment in which the data transfer rate is limited, as in a network such as the Internet.

"Evaluation of Artificial Reality: Chapter 1" discloses a system for superimposing an outer appearance formed by CG on an assistive robot performing tasks indoor. The error of the CG display position is such that the size of the displayed CG is increased larger than the actual robot [pg. 18, lines 7 – 15]. This increased size of the display CG corresponds to the nimbus as disclosed. The configuration of an augmented reality image display system is shown in Fig. 1.32. Based on the visual point position and attitude information obtained from a three-dimensional position sensor attached to the head, CG are generated by a computer [pg. 10, lines 24 – 25; pg. 11, line 1]. Furthermore, the CG can be selected by taking the form of a character that the user

likes, a deceased spouse, or the like [pg. 7, lines 1 – 3; Fig. 1.3]. Simultaneously, a real image of the background is obtained from a CCD camera, and using the luminance key synthesis of a video mixer, each are synthesized and displayed on an HMD as augmented reality [pg. 10, lines 24 – 25; pg. 11, lines 1 – 4]. The video mixer also doubles as the combined image sending device, where as shown in Fig. 1.32, the video mixer sends the combined image of the CG and real image obtained by the camera to the HMD. Furthermore, in this system, an Isotrak2 (made by Polhemus) is used as the magnetic three-dimensional position sensor. The computer is a TD-30 (made by Intergraph; CPU: Pentium 133 MHzx2, with built-in Open GL graphics accelerator), and an FS5 (made by Virtual Research Systems) is used as the HMD [pg. 11, lines 5 – 10].

Yuasa et al. teaches an image rendering apparatus and method intended for use in an environment in which the data transfer rate is limited, as in a network such as the Internet. As shown in Fig. 1, the rendering apparatus (100) resides in the computer (102). The rendering apparatus may form part of a graphics card located in the computer or may be a hardware accessory that plugs into or is otherwise connected to the graphics card of the computer [col. 6, lines 28 – 48]. The computer is shown connected via the I/O port (104) as a client of the network (106). The I/O port is connected directly or indirectly to the bus (108) to which other elements of the rendering apparatus and the computer are connected. The network, I/O port and bus constitute a path through which the rendering apparatus receives three-dimensional graphics data including texture data defining one or more textures (claims **9**, **16**, **23**: ***comprising a***

communication device for receiving the computer graphics from outside via a network) [col. 6, lines 39 – 46].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the rendering apparatus of Yuasa et al. as a part of the Open GL graphics accelerator built-in the computer disclosed in "Evaluation of Artificial Reality: Chapter 1", as well as incorporate the I/O port of Yuasa et al. to connect the computer disclosed in "Evaluation of Artificial Reality: Chapter 1" to a network because this would allow the user to import images from other sources, such as the internet, when the user is opting to select the CG by taking the form of a character that the user likes, a deceased spouse, or the like ["Evaluation of Artificial Reality: Chapter 1": pg. 7, lines 1 – 3; Fig. 1.3]. Furthermore, importing the images from another source provides a larger range of characters the user may choose from as well as saving memory space on the computer by not having to generate and save multitudes of characters.

8. Claims **10**, **17**, **24**, **26** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Evaluation of Artificial Reality: Chapter 1".

"Evaluation of Artificial Reality: Chapter 1" teaches the limitations of claims **10**, **17**, **24**, **26** except disclosing a second actual object. However, "Evaluation of Artificial Reality: Chapter 1" teaches the CG of a human shape is superimposed on an arm-type care-giving robot used for a carrying task [pg. 20, lines 7 – 9]. The claim rejections for claims 1 – 4, 11, 12, 18, 19, and 25 are incorporated as reference herein. The camera

as shown in Fig. 1.32 will record the robot carrying the item related to the carrying task and the video mixer superimposes the CG of a human shape on top of the robot. Since the CG is only of the human shape and does not contain a CG of the item related to the carrying task, it would have been obvious to one of ordinary skill in the art that the work station shown in Fig. 1.32 provides a mask of some type to reveal the item related to the carrying task so that the super-imposed image sent to the HMD via the video mixer displays the item to the user so the robot looks like a character the user finds comforting performing the task (claims **10**, **17**, **24**, **26**: ***wherein the computer graphics have a lacking area for showing the observer a second actual object having a part which exists on the observer side than the actual object***). Although a CG was superimposed on a target robot standing still, the robot actually changes position and attitude over time [pg. 22, lines 7- 9]. The error of the CG display position is such that the size of the displayed CG is increased larger than the actual robot [pg. 18, lines 7 – 15]. This error, i.e. nimbus, compensates for the possible movement of the robot so when the robot moves, there is no chance that the actual robot will be seen apart from the CG superimposed. Thus, if the robot were carrying an item, it would have been obvious to include a nimbus around the item for the same reason (claims **10**, **17**, **24**, **26**: ***wherein said nimbus generating device also generates a nimbus image around a periphery of the lacking area***).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle K. Lay whose telephone number is (571) 272-7661. The examiner can normally be reached on Monday - Friday, 7:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272-7664. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michelle K. Lay
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Art Unit 2672

08.10.2005 mkl

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